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Editorial

Enzymes in Fibre Processing

Advances in enzymology, genetics and industrial enzyme production make existing technologies using enzymes for fibre processing more attractive and open up new possibilities such as the improvement of synthetic fibers. Together with increasing knowledge about fibre morphology, more efficient processing and higher product quality become feasible.

The 3rd International Conference on Biotechnology in the Textile Industry INTB04 held in Graz, Austria from June 13–16 2004 provided a thorough overview of the current and future focus of enzymology in the materials processing industry. It stimulated discussions between experts from universities, research organizations and industry worldwide. Over 150 participants from 32 countries in 4 continents (one third of all participants coming from industry) ensured that this meeting had a strong impact in the area of biotechnology in materials processing.

The main scientific themes of INTB04 focused on new enzyme systems designed for fibre processing, advances in process development and integration and enzymatic treatment of textile effluents. All aspects related to bioprocessing of natural fibres (cotton, wool, hemp) and synthetic fibers (polyester, polyacrylonitrile, nylon) were covered. Enzymatic degradation of dyes and bioscouring were discussed in detail at previous INTB conferences (Athens, USA, 2002 and Povoa, Portugal, 2000) and remain important research areas.

Discovery of new enzymes modifying polyethyleneterephthalate (Alisch *et al*., 2004, Fischer-Colbrie *et al*., 2004) together with new monitoring techniques (O'Neill and Cavaco-Paulo, 2004) open up new opportunities for targeted enzymatic surface functionalisation of PET, a polymer formerly considered to be resistant to biodegradation.

Using model dyes Almansa *et al*. (2004) and Kandelbauer *et al*. (2004) show that there is a correlation between dye structure (i.e. type of substituents on aromatic rings) and laccase catalysed degradation. Together with knowledge about mechanisms of fungal dye degradation (Maximo *et al*., 2004; Nerud *et al*., 2004) this information will allow recycling of dying effluents and form a base for the synthesis of biodegradable dyes. While laccases can be used both in degradation and in synthesis of dyes microbial reduction of indigo represents an environmental friendly alternative for denim dyeing (Nicholson and John, 2004).

In contrast to enzymatic functionalisation of synthetic fibres, the application of enzymes in cotton processing has reached a stage where process integration has become an important issue (Choe *et al*., 2004; Cziszar *et al*., 2004; Lenting and Warmoeskerken, 2004). Currently major research efforts are being carried out in the area of targeted enzymatic functionalisation of polymer based materials. Thus, we expect a number of contributions in this application for the next INTB conference to be held in Korea 2006 but we also look ahead to the elucidation of mechanistic aspects related to oxidoreductases and hydrolases in fibre processing.

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